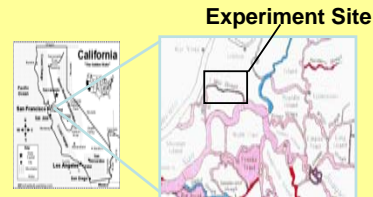


Does the Water hyacinth weevil (*Neochetina bruchi*) respond to changes in leaf tissue quality in Sacramento-San Joaquin Delta populations?

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Introduction

- **1982** Legislative action requires California Dept. of Boating and Waterways (DBW) to manage Water hyacinth in the Sacramento-San Joaquin Delta. DBW release three biological control agents (*Niphograpta albiguttalis*, *Neochetina eichhorniae*, and *Neochetina bruchi*) and begin herbicide treatments.
- **1982-1999** DBW continues herbicide management.
- **1999** Threat of Clean Water Act lawsuit by environmentalists halts herbicide application.
- **2000** No herbicides applied.
- **2001** Herbicide treatments limited by National Pollution Discharge and Elimination System (NPDES), USFWS, and NOAA fisheries. Herbicide treatment severely restricted by location, season (June-October), and volume.
- **Herbicide monitoring: \$2 Million/year**
- **2003** DBW supports biological control research on *N.bruchi*.



Approach & Methods

- 24 (10m²) floating PVC quadrats established for weevil release in 7 Mile Slough
- Each quadrat was filled with Water hyacinth plants (~70% full) and allowed to acclimate for 2 weeks
- 9 mesh bags containing 0g, 100g, or 300g Osmocote fertilizer equidistantly placed 10-20cm below the water surface in each quadrat.
- 300 adult *N.bruchi* were released into 12 of the quadrats. Bimonthly sampling of water, plant tissue, and monitoring of growth rates, feeding scars.
- Quarterly removal of 8 plants/quadrat for dissection of all life stages of *N.bruchi*, plant measurements and leaf tissue analysis.
- Bimonthly dissection of plants from USDA ponds for assessment of over-wintering strategies and activity of *N.bruchi*.



N.bruchi

Observations Taken

Plant: Lamina length & width, petiole length, canopy height, flowering, feeding scars, %N, %P.

***N.bruchi*:** # egg, larvae (instar), pupae, adults/plant

Water: NH₃, NH₄, NO₃, P, Ca, pH, Turbidity, Temperature, TDS, DO

Air: Temperature, RH

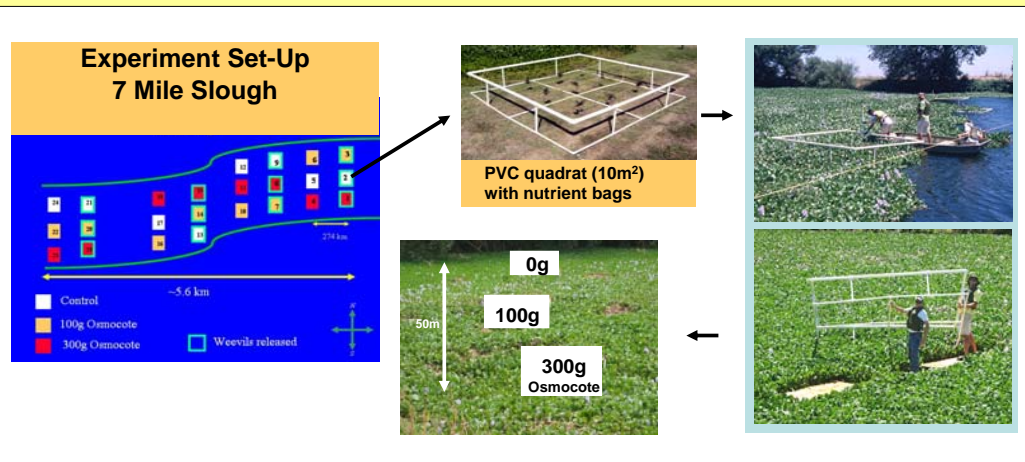
Objectives

- Determine whether plant tissue quality can be an indicator for successful establishment of *N.bruchi* where herbicide treatments are restricted/limited.
- Determine whether local nutrient enrichment of water will assist the establishment of *N.bruchi*.
- Determine survival and over-wintering strategies of *N.bruchi* in the Sacramento-San Joaquin Delta.

References

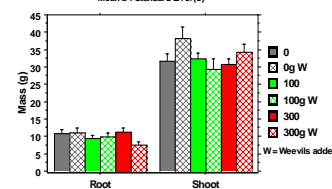
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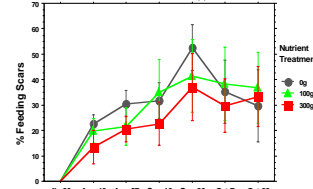


Preliminary findings

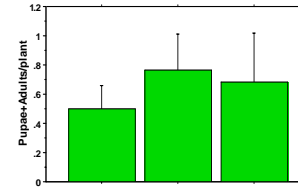
Plant dry weights three months post weevil addition
Mean \pm 1 Standard Error(s)



Percentage of leaves with 2 or more feeding scars/25m²
Error Bars: \pm 1 Standard Error(s)



Number of adults and pupae/plant 3 months post weevil addition
Error Bars: \pm 1 Standard Error(s)



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